Patient and Caregiver Characteristics Associated with Depression in Caregivers of Patients with Dementia

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OBJECTIVE: **Many patients with dementia who live at home would require nursing home care if they did not have the assistance of family caregivers. However, caregiving sometimes has adverse health consequences for caregivers, including very high rates of depression. The goal of this study was to determine the patient and caregiver characteristics associated with depression among caregivers of patients with dementia.**

DESIGN: **Cross-sectional study.**

PARTICIPANTS AND SETTING: **Five thousand six hundred and twenty-seven patients with moderate to advanced dementia and their primary caregivers upon enrollment in the Medicare Alzheimer's Disease Demonstration (MADDE) at 8 locations in the United States.**

MEASUREMENTS: **Caregiver depression was defined as 6 or more symptoms on the 15-item Geriatric Depression Scale. Patient characteristics measured included ethnicity and other demographic characteristics, income, activities of daily living (ADL) function, Mini-Mental Status Exam (MMSE) score, and behavioral problems. Caregiver characteristics measured included demographic characteristics, relationship to the patient, hours spent caregiving, and ADL and Instrumental Activities of Daily Living (IADL) function. We used χ^2 and *t* tests to measure the bivariate relationships between patient and caregiver predictors and caregiver depression. We used logistic regression to determine the independent predictors of caregiver depression.**

RESULTS: **Thirty-two percent of caregivers reported 6 or more symptoms of depression and were classified as depressed. Independent patient predictors of caregiver depression included younger age (odds ratio [OR], 1.91; 95% confidence interval [CI], 1.33 to 2.76 in patients less than 65 years compared to patients over 85 years), white (OR, 1.53; 95% CI, 1.18 to 1.99) and Hispanic ethnicity (OR, 2.50; 95% CI, 1.69 to 3.70) compared to black ethnicity, education (OR, 1.16; 95% CI, 1.01 to 1.33 for those with less than a high school education), ADL dependence (OR, 1.55; 95% CI, 1.26 to 1.90 for patients dependent in 2 or more ADL compared to patients dependent in no ADL), and behavioral disturbance, particularly angry or aggressive behavior (OR, 1.47; 95% CI, 1.27 to 1.69 for patients with angry or aggressive behavior). Independent caregiver predictors of depression included low income (OR, 1.45; 95% CI, 1.18 to 1.77 for less than $10,000/per year, compared to >$20,000 per year), the relationship to the patient (OR, 2.73; 95% CI, 1.31 to 5.72 for wife, compared to son of male patient), hours spent caregiving (OR, 1.89; 95% CI, 1.51 to 2.38 for 40 to 79 hours/week compared to less than 40 hours/week), and functional dependence (OR, 2.53; 95% CI, 2.13 to 3.01 for ADL dependent compared to IADL independent).**

CONCLUSION: **Caregiver depression is a complex process, influenced by ethnicity as well as diverse patient and caregiver characteristics. Efforts to identify and treat caregiver depression will need to be multidisciplinary and focus on multiple risk factors simultaneously.**

KEY WORDS: **caregivers; depression; Alzheimer's disease; dementia; race/ethnicity.**
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Many patients with dementia lose the ability to live independently without the assistance of others. The majority of these patients continue to live at home because of the unpaid assistance of family caregivers.[1–4] Without the assistance of these caregivers, many more patients with dementia would require nursing home care and the public costs of long-term care would increase dramatically.[1] Unfortunately, caregiving can often have serious adverse health and personal consequences for caregivers.[5,6] Depression is one of the most important potential adverse consequences for caregivers because it is common, associated with poor quality of life, and is a risk factor for other adverse outcomes including functional decline and mortality.[7–21]

Previous work suggests depression in caregivers results from a complex interplay of factors that includes characteristics of the patient and caregiver, as well as cultural factors.[8,13,18,19,22,23] There is strong evidence that difficult patient behaviors such as anger and aggressiveness influence caregiver depression, and these behavioral manifestations of dementia may be more influential than the degree of cognitive impairment.[8,18,22] Several studies suggest that caregivers with poorer health, or fewer financial resources, are at higher risk for depression. Some evidence also suggests that women and spousal caregivers are at higher risk for depression.[8,18] A number of studies have suggested that caregivers of African-American patients are at lower risk for depression than caregivers of white patients.[13]

There are several reasons why it is important to develop a better understanding of the risk factors for caregiver depression. First, it would be useful to clinicians caring for caregivers by identifying caregivers in whom more aggressive screening efforts may be indicated. Second, it could help identify groups in whom interventions aimed

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at reducing caregiver depression burden and depression should be targeted. Third, it may help inform our understanding of the etiology of caregiver depression.

While other studies have assessed predictors of caregiver depression, our knowledge of the determinants of caregiver depression is limited for a number of reasons.[13,18] First, many studies have been limited in their conceptual focus and have not simultaneously examined many domains of risk likely to predict caregiver depression. For example, although prior studies have found that both patient and caregiver characteristics are associated with caregiver depression,[18] many studies have focused mostly on patient characteristics, and some caregiver characteristics, such as the functional status of the caregiver, have often not been considered. Second, many studies have been small, limiting their ability to identify characteristics that may have a modest, but clinically important association with depression.

To better understand the multiple domains of risk factors for caregiver depression, we examined the patient and caregiver characteristics associated with caregiver depression in 5,788 caregivers of patients with moderate to advanced dementia.[24] This cohort provides a unique opportunity to understand the multidimensional predictors of caregiver depression because it is one of the largest studies to consider caregiver depression and because of the availability of extensive data describing characteristics of both the patient and caregiver.

METHODS

Patient and Caregiver Enrollment

Subjects were enrolled in the Medicare Alzheimer's Disease Demonstration (MADDE), a randomized trial of expanded community-based services and case management for patients with dementia and their caregivers.[24–27] The intervention consisted of expanded in-home and community-based services and case management compared with usual care.[25] Beginning in December 1989, subjects were enrolled over a 2-year period at 8 sites thought to be broadly reflective of the demographic make-up of the United States (Champaign-Urbana Ill; Cincinnati, Ohio; Memphis, Tenn; Miami, Fla; Minneapolis, Minn; Parkersburg, Tenn; Portland, Ore; and Rochester, NY) and then observed for 36 months, with the last assessment occurring in December 1994. Patients were recruited by physician referral and self-referral. Eligibility was established from a screening questionnaire and the physician referral form. Criteria for inclusion consisted of 1) a physician-certified diagnosis of irreversible dementia; 2) enrollment in or eligibility for Parts A and B of Medicare; 3) residence in one of the demonstration project site's catchment areas; 4) living in the community; and 5) presence of a primary caregiver. On the enrollment interview, only the primary caregiver was interviewed, defined as the person most responsible for caring for the patient. A total of 8,095 patients were screened, with a total of 5,788 patients with dementia and their caregivers enrolled in MADDE.[24] Of these, information on caregiver depression was available for 5,627 caregivers, all of whom were informal (unpaid). Patients from the intervention and control arms were combined for this analysis since this analysis assesses predictors of depression at the time of enrollment, prior to the intervention. However, the intervention had no effect on patients' outcomes, such as nursing home placement, the use of community services, Medicare claims, or on caregiver outcomes such as burden and depression.[24,26,27]

Measurements: Patient Predictors

At baseline, a trained interviewer administered an in-home assessment to the patient and to his/her primary caregiver. Information on patient age, gender, marital status, education, ethnicity, living situation, and income was collected. The patient's cognitive status was assessed at enrollment with the 30-point Mini-Mental Status Exam (MMSE).[28] The patient's physical function was assessed by asking the caregiver if the patient had difficulty with each of 5 activities of daily living (ADL): bathing, eating, dressing, transferring, and toileting.[29] Caregivers were also asked about the patient's degree of bowel and bladder continence. Caregivers were asked whether the patient typically experienced a series of behavioral problems. We categorized difficult behaviors into 3 categories: 1) angry or aggressive behavior; 2) danger to self or others; or 3) wakes caregiver up at night.[24]

Measurements: Caregiver Predictors

Caregivers were interviewed in person. Interviewers asked caregivers to report their age, gender, education, marital status, income, average number of hours per week they took care of the patient, and the relationship to the patient. Hours per week spent caregiving was based on the caregiver's report, and no attempt was made to validate these reports. Relationship to the patient was classified as husband, wife, son, daughter, and other. We included sons-in-law and daughters-in-law in the other category because there were insufficient numbers of these relationships to analyze them separately. The "other" category also included more distant relatives and nonfamily unpaid caregivers. Caregiver functional dependence was measured with the Katz ADL scale and with the Lawton Instrumental Activities of Daily Living (IADL) scale.[30] We characterized caregivers as either independent in all ADL and IADL, ADL independent but IADL dependent, or ADL dependent.

Measurements: Caregiver Depression

Interviewers administered the 15-item Geriatric Depression Scale (GDS) to assess caregiver depression.[31,32] The GDS is a validated and frequently used measure of depression in older people. Since the GDS focuses on the nonsomatic symptoms of depression, it is less likely to be confounded by physical illness. We used the

recommended cutoff of ≥6 symptoms to indicate presence of depression.[31,33,34]

Statistical Analysis

Using bivariate analyses, we analyzed both patient and caregiver predictors of caregiver depression (GDS ≥ 6). Continuous variables were categorized based on their distribution or clinically appropriate cutoffs. We used χ^2 tests, modified for trend when appropriate, to calculate *P* values.

To determine independent predictors of caregiver depression, we used logistic regression. In developing our final model we used a 2-step process. First, we separately developed stepwise models for patient and caregiver variables. We considered for entry variables significant in the bivariate analyses ($P < .20$). We then developed a final stepwise model that combined patient and caregiver characteristics, considering for inclusion variables independently associated with depression in the patient and caregiver models. Models that used forward and backward selection strategies produced the same result. We also tested selected interaction terms (between ethnicity and behaviors, ethnicity and income, ethnicity and patient ADL function, caregiver relationship and hours caregiving, and caregiver relationship and patient ADL function) but none were statistically significant. Analyses that also adjusted for study site produced similar results.

RESULTS

Characteristics of Patients and Caregivers

The mean age of the 5627 patients was 79 years and 59% were women (Table 1a). Most (88%) were white and 44% had less than a high school education. A total of 82% were dependent in at least 1 ADL and almost half had at least some degree of incontinence. The mean MMSE score was 14, and most patients had at least 1 difficult behavior.

The mean age of the caregivers was 64 years and 72% were women (Table 1b). Most (78%) lived with the patient. Caregivers reported spending a mean of 89 hours per week caring for the patient. About two-thirds of caregivers were independent in all ADL and IADL.

Table 1a. Characteristics of Patients (*N* = 5,627)

	n	%
Age		
Less than 65	194	3.5
65–74	1,446	25.7
75–84	2,828	50.3
Greater than 85	1,159	20.6
Gender		
Male	2,295	40.8
Female	3,332	59.2
Ethnicity		
White	4,956	88.1
Black	445	7.9
Hispanic	215	3.8
Other	11	0.2
Marital status		
Married	3,230	57.4
Not married	2,397	42.6
Income		
Less than $10,000	1,891	34.5
$10,000 to $20,000	2,048	37.3
Greater than $20,000	1,547	28.2
Education		
High school or greater	3,128	55.8
Less than high school	2,483	44.3
Living arrangement		
Alone	742	13.2
Not alone	4,885	86.8
ADL dependencies		
0	1,003	17.8
1	781	13.9
2–5	3,843	68.3
Bowel/bladder		
Complete bladder control	2,865	51.1
Occasional wet beds	1,262	22.5
Frequent wet beds	675	12.0
No control over bowels and bladder	804	14.3
MMSE score		
Less than 15	2,464	46.6
15–20	1,329	25.1
Greater than 20	1,497	28.3
Behavioral disturbances		
Anger and aggressiveness	3,660	65.8
Danger to self or others	2,168	38.9
Wakes caregiver up at night	2,580	46.2

ADL, activities of daily living; MMSE, mini-mental status exam.

Predictors of Caregiver Depression—Bivariate Analyses

Caregivers reported a mean of 4.4 symptoms of depression. Thirty-two percent had 6 or more symptoms of depression and were classified as depressed. Patient characteristics associated with higher rates of caregiver depression included younger age, male gender, Hispanic ethnicity, being married, less education, higher levels of ADL dependence, incontinence, lower MMSE scores, and presence of problem behaviors (Table 2a). Caregiver characteristics associated with higher rates of caregiver depression included older age, female gender, living with the patient, less education, being the spouse or daughter of the patient, more time spent caregiving, and worse physical function (Table 2b).

Predictors of Caregiver Depression—Multivariate Analysis

In a logistic regression model, controlling for both patient and caregiver characteristics, patient characteristics independently associated with a higher risk of caregiver depression included younger age (odds ratio [OR], 1.91; 95% confidence interval [CI], 1.33 to 2.76 for patients less than 65 years compared to patients ≥85 years), white (OR, 1.53; 95% CI, 1.18 to 1.99) or Hispanic ethnicity (OR, 2.50; 95% CI, 1.69 to 3.70) compared to black ethnicity, less education (OR, 1.16; 95% CI, 1.01 to 1.33), higher levels of

Table 1b. Characteristics of Caregivers (*N* = 5,627)

	n	%
Age		
Less than 65	2,753	49.0
65–74	1,424	25.3
75–84	1,232	21.9
Greater than 85	211	3.8
Gender		
Male	1,570	28.3
Female	3,972	71.7
Marital status		
Married	4,560	81.1
Not married	1,064	18.9
Lives with patient		
Yes	4,406	78.3
No	1,221	21.7
Income		
Less than $10,000	685	13.3
$10,000 to $20,000	1,665	32.2
Greater than $20,000	2,821	54.6
Education		
High school or greater	4,423	78.7
Less than high school	1,201	21.4
Caregiver relationship		
Husband	1,011	18.0
Wife	1,827	32.5
Daughter	1,597	28.4
Son	467	8.3
Other	725	12.9
Hours of caregiving		
0–39	1,549	27.7
40–79	864	15.4
80–119	1,250	22.3
120–168	1,937	34.6
Caregiver function		
Independent in all ADL and IADL	3,766	67.0
ADL independent, IADL dependent	962	17.1
ADL dependent	892	15.9
Caregiver depression		
Mean (SD)	4.4	(3.4)
0–5	3,826	68.0
Greater than or equal to 6	1,801	32.0

ADL, activities of daily living; IADL, Lawton instrumental activities of daily living.

ADL dependency (OR, 1.55; 95% CI, 1.26 to 1.90 for patients dependent in 2 or more ADL), and the presence of a behavioral problem, especially anger or aggressiveness (OR, 1.47; 95% CI, 1.27 to 1.69) (Table 3). Caregiver characteristics associated with higher rates of depression included the caregiver's relationship to the patient (highest for wife, OR, 2.73; 95% CI, 1.31 to 5.72, compared to son of male patient), hours per week spent caregiving (OR, 1.89; 95% CI, 1.51 to 2.38 for 40–79 hours/week compared to <40 hours/week), and poor caregiver physical function (OR, 2.53; 95% CI, 2.13 to 3.01 for caregivers dependent in at least 1 ADL).

DISCUSSION

This cross-sectional study is one of the largest studies conducted to date analyzing the predictors of depression in caregivers of patients with moderate to severe dementia. We confirmed previous research documenting very high rates of depression in caregivers.[18] Nearly one-third (32%) of caregivers had 6 or more symptoms of depression on the GDS-15, a score that in clinical settings is suggestive of the diagnosis of major depression[32] and strongly associated with adverse outcomes such as functional decline, hip fracture, and nursing home placement.[20,21,35]

Our study demonstrates that caregiver depression is a complex process, mediated by cultural factors (as measured by the ethnicity of the patient), patient characteristics, and caregiver characteristics. Patient characteristics that predicted caregiver depression included younger patient age and dementia severity. In terms of dementia severity, multiple dimensions of severity are important including ADL function and behavioral symptoms. Caregiver characteristics that predicted depression included low levels of financial resources (income), the relationship to the patient (daughter or wife), more hours spent caregiving, and poor caregiver functional status. While most of these factors have been demonstrated to be predictors of caregiver depression in other studies, this study is one of the few to have examined all of these factors simultaneously.[13,18,22] By demonstrating that all of these factors must be considered to understand caregiver depression, our results demonstrate that caregiver depression can only be understood by a complete understanding of both the patient and caregiver, and their cultural context.

Our results demonstrate important ethnic differences in rates of caregiver depression, with the lowest rates in caregivers of black patients, and the highest rate in caregivers of Hispanic patients. These results are consistent with most, but not all prior studies.[13] The lower rate of depression in caregivers of African-American patients may be explained by other research demonstrating that African-American caregivers respond differently to the stresses of caregiving than white caregivers.[13,36] The markedly higher rate of depression in caregivers of Hispanic patients is consistent with earlier studies showing higher rates of depression and/or personal role strain among Hispanic caregivers.[11,37] Possible explanations may also be found in other research. Baseline levels of depression vary among ethnic groups, and some studies have indicated that Hispanic elders have a higher prevalence of depression,[38] though it is not clear whether this reflects true differences in symptomatology or differential item functioning of the instruments used to measure depression. The meaning attached to dementia and its disruptive effect on the family unit may have particular significance for Hispanic caregivers.[38–41] Different levels of acculturation of Hispanic caregivers relative to the patient for whom they are caring may also impact caregiver depression rates.[39] Ethnic differences in caregiver depression may also be influenced by different expectations about responsibilities toward elders, competing demands on time that may vary by culture and ethnicity, and differential local availability of other caregivers.

Table 2a. Relationship Between Patient Characteristics and Caregiver Depression (Bivariate Analysis) (*N* = 5,627)

Patient Characteristic		% with More Than 5 Depressive Symptoms	*P* Value
Age			
Greater than 85		29.4	<.001
75–84		31.7	
65–74		33.1	
Less than 65		43.8	
Gender			
Male		40.3	<.001
Female		26.3	
Ethnicity			
Black		28.3	<.001
White		31.7	
Hispanic		45.6	
Other		36.4	
Marital status			
Married		38.1	<.001
Not married		23.8	
Income			
Less than $10,000		28.8	.006
$10,000 to $20,000		34.3	
Greater than $20,000		33.0	
Education			
Less than high school		34.0	.006
High school or greater		30.5	
Living arrangement			
Alone		15.5	<.001
Not alone		34.5	
ADL dependencies			
0		19.7	<.001
1		27.5	
2–5		36.1	
Bowel/bladder			
Complete bladder control		28.4	<.001
Occasional wet beds		34.1	
Frequent wet beds		35.3	
No control over bowels and bladder		39.1	
MMSE score			
Greater than 20		29.1	<.001
15–20		28.4	
Less than 15		35.5	
Behavioral disturbance			
Anger and aggressiveness	Yes	35.4	<.001
	No	25.4	
Danger to self or others	Yes	36.7	<.001
	No	29.0	
Wakes caregiver up at night	Yes	39.2	<.001
	No	26.0	

ADL, activities of daily living; MMSE, mini-mental status exam.

Interestingly, the relation between ethnicity and depression is different from the relationship between ethnicity and risk of nursing home placement we previously reported in these patients.[24] While caregivers of Hispanic patients have considerably higher rates of depression than caregivers of white and black patients, they have considerably lower rates of nursing home placement. This discordance between rates of caregiver depression and nursing home placement needs evaluation in future studies.

Behavioral disturbances (particularly angry or aggressive behavior) and decreased patient ADL function both were independently associated with caregiver depression. Our findings with respect to behavioral disturbances are consistent with prior studies.[18,22] However, most studies have not identified a relationship between patient ADL function and caregiver depression. Since patient ADL function is strongly correlated with other predictors of caregiver depression, such as caregiver work hours and behavioral disturbance, smaller studies may not have been able to identify the moderate but clinically important impact of patient ADL function.

Our findings with respect to caregiver characteristics further demonstrate that caregiver depression is a complex interplay of medical, social, and economic factors. Both

Table 2b. Bivariate Analysis of Caregiver Depression by Caregiver Characteristics

Caregiver Characteristic	% with More Than 5 Depressive Symptoms	*P* Value
Age		
<65	26.0	<.001
65–74	38.1	
75–84	38.2	
>= 85	33.7	
Gender		
Male	26.6	<.001
Female	34.5	
Marital status		
Married	32.2	.486
Not married	31.1	
Living arrangement		
Living with subject	36.2	<.001
Not living with subject	17.0	
Income		
Greater than $20,000	26.2	<.001
$10,000 to $20,000	38.0	
Less than $10,000	40.7	
Education		
Less than high school	42.0	<.001
High school or greater	29.3	
Caregiver relationship		
Husband	32.3	<.001
Wife	44.3	
Daughter/daughter-in-law	27.9	
Son/son-in-law	16.0	
Other	16.6	
Hours of caregiving		
0–39	15.3	<.001
40–79	32.4	
80–119	37.0	
120–168	41.8	
Caregiver function		
Independent in all ADL and IADL	24.5	<.001
ADL independent, IADL dependent	43.8	
ADL dependent	51.1	
Caregiver health		
Excellent	15.1	<.001
Good	29.3	
Fair	55.4	
Poor	74.5	

ADL, activities of daily living; IADL, Lawton instrumental activities of daily living.

male and female spouses had high levels of depression, but among adult children, levels of depression were higher among daughters than sons. Both the health (as measured by ADL and IADL function) and economic resources (as measured by income) caregivers bring to caregiving predicted the risk of depression. Physical and economic health probably both mitigate the stresses of caregiving. Caregivers with better ADL function are probably more able to withstand the physical demands of caregiving. Caregivers with higher income probably have more access to supportive services like home health aides and adult day health that may help minimize the burdens of caregiving.

Our study has several strengths. The sample size is large, making this one of the largest studies of caregiver depression. We considered a diverse array of social, patient, and caregiver characteristics that could plausibly influence depression, and our large sample size made it likely that we could identify clinically important effects. However, our study also has some limitations. First, the generalizability of our findings is uncertain because we studied patients with fairly advanced dementia who agreed to be part of an intervention. However, this impact on generalizability is balanced by the 8-site design of our study, making our patient population more diverse than most prior studies. Second, we relied on physician diagnoses of dementia, rather than clinical evaluations of patients. Third, while we considered multiple predictors of caregiver depression, we did not have information on other predictors such as the quality of the caregiver–patient relationship or caregivers' stress appraisals.[22,42] Fourth, our measure of depression was the GDS and not a DSM-IV diagnosis of depression. While scores of 6 or more on the GDS are strongly correlated

Table 3. Predictors of Caregiver Depression: Multivariate Analysis

	Odds Ratio	95% CI
Patient characteristics		
Age		
Greater than 85	1.00	—
75–84	1.10	0.92 to 1.31
65–74	1.25	1.02 to 1.53
Less than 65	1.91	1.33 to 2.76
Ethnicity		
Black	1.00	—
White	1.53	1.18 to 1.99
Hispanic	2.50	1.69 to 3.70
Other	1.23	0.28 to 5.39
Education		
High school or greater	1.00	—
Less than high school	1.16	1.01 to 1.33
ADL dependencies		
0	1.00	—
1	1.42	1.10 to 1.82
2–5	1.55	1.26 to 1.90
Behavioral disturbances		
Anger & aggressiveness	1.47	1.27 to 1.69
Danger to self or others	1.29	1.13 to 1.47
Wakes caregiver up	1.21	1.05 to 1.39
Caregiver characteristics		
Income		
Greater than $20,000	1.00	—
$10,000 to $20,000	1.15	0.99 to 1.33
Less than $10,000	1.45	1.18 to 1.77
Relationship		
Son of male	1.00	—
Son of female	1.24	0.57 to 2.73
Wife of male	2.73	1.31 to 5.72
Husband of female	1.88	0.89 to 3.97
Daughter of male	2.62	1.20 to 5.73
Daughter of female	2.06	0.99 to 4.29
Other relationship	1.16	0.55 to 2.46
Hours caregiving		
0–39	1.00	—
40–79	1.89	1.51 to 2.38
80–119	2.14	1.72 to 2.65
120–168	2.12	1.71 to 2.63
Functional status		
Independent	1.00	—
Department IADL/independent. ADL	1.80	1.52 to 2.13
Department ADL	2.53	2.13 to 3.01

CI, confidence interval; ADL, activities of daily living; IADL, Lawton instrumental activities of daily living.

with clinical diagnoses of major depression, not all patients with scores at this level would meet diagnostic criteria for major depression.[31,32] However, in older patients, depressive symptoms adversely impact quality of life, regardless of whether or not a patient meets criteria for major depression. Furthermore, high GDS scores are correlated with poor outcomes such as functional decline and death, regardless of whether or not the patient has major depression.[20,21] Fifth, we only interviewed 1 caregiver per patient. In many cases, patients may have more than 1 caregiver, and dynamics between the caregivers may have impacts on caregiver depression. Sixth, we did not directly measure caregiver ethnicity. In some cases, the race of the caregiver and patient probably differed. Finally, many of our predictor variables were based on caregiver reports and it is possible these reports may have been influenced by depression. For example, depressed caregivers may be more likely to overestimate the physical limitations of the patient and the extent to which patient behaviors are considered problematic and underestimate the quality of life of the patient.[43] This, and the cross-sectional nature of the study, makes it difficult to differentiate whether some variables influence caregiver depression versus whether caregiver depression influences the reporting of these variables. A similar issue arises with respect to the reporting of hours spent caregiving. Many caregivers reported spending close to every hour of the week caring for the patient. It is possible that depressed caregivers may have only felt

they were spending more time providing care. However, these reports may realistically reflect the predicament many caregivers face in which they can never leave the patient alone and may need to provide care at any hour. For example, many symptoms of dementia, including wandering, day–night reversal, agitation, and incontinence frequently interrupt the sleep of caregivers.[44]

The most important finding of our multivariable analysis is that multiple caregiver and patient processes independently predict caregiver depression. This demonstrates that caregiver depression is a problem that needs to be viewed from a wide clinical and social framework. However, it would not be correct to make excessive causal inferences based on the final variables that did or did not remain in our multivariable models. There are multiple reasons potentially important determinants of an outcome may not remain in a multivariate model. This includes control for a variable more distal on the causal path, or inclusion of a collinear variable. For example, for spouses, caregiver and patient age may be closely correlated, and the selection between these 2 variables may be influenced by chance.

Because of the high prevalence of caregiver depression, and its potential association with adverse outcomes, clinicians should have a high index of suspicion for depression in their patients who care for family members with dementia.[5–21] While little research has focused specifically on the treatment of depression associated with caregiving, it seems likely that pharmacologic and nonpharmacologic treatments that are effective in general groups of people with depression should also be effective in caregivers with depression. Furthermore, some evidence suggests that interventions focused on caregiver support may reduce rates of caregiver depression and burden, as well as rates of nursing home placement.[45]

In conclusion, we found that caregiver depression is a complex clinical and social problem, influenced in part by the ethnicity of the patient, as well as multiple patient and caregiver characteristics. Like other common problems related to aging, caregiver depression is therefore best approached by viewing it as a problem induced by the interactive effects of multiple risk factors, rather than a problem induced by any single dominant risk factor. This suggests that efforts to identify and treat caregiver depression will need to be multidisciplinary, consider the cultural context of the patient and caregiver, and focus on multiple risk factors simultaneously.

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